

DATA SHEET

LS Programmable Logic Controller XGB Compact Economy Type

XGB XBC-DR10E
XBC-DR14E
XBC-DR20E
XBC-DR30E



- When using LSIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out and read it whenever necessary.



Davis Controls Ltd is the authorized distributor of LSIS equipment and control solutions throughout Canada.

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Thank you for your business and your interest in LSIS solutions.

LS constantly endeavors to improve our products so that information in this datasheet is subject to change without notice.

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■ Safety Precautions

- Safety Precautions is for using the product safely and correctly in order to prevent the accidents and danger, so please go by them.
- The precautions explained here only apply to this module. For safety precautions on the PLC system, refer to User's manual.
- The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.



Warning If you violate instructions, it can cause death, fatal injury or a considerable loss of property



Caution If you violate instructions, it can cause a slight injury or a slight loss of products

- The symbols which are indicated in the PLC and User's Manual mean as follows.
- ! This symbol means paying attention because of danger of injury, fire, or malfunction
- This symbol means paying attention because of danger of electric shock.
- ⚡ Store this datasheet in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user

■ Handling Precautions

- Don't drop or make impact.
- Don't detach PCB from case. It may cause problem.
- When wiring, let no foreign material go into the module. If it goes into the module, remove it.
- Don't detach the module from slot while power is on



Warning

- **Do not contact the terminals while the power is applied.**
Risk of electric shock and malfunction.
- **Protect the product from being gone into by foreign metallic matter.**
Risk of fire, electric shock and malfunction.
- **Risk of fire, electric shock and malfunction.**
Risk of injury and fire by explosion and ignition.

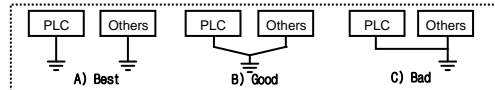


Caution

- **Be sure to check the rated voltage and terminal arrangement for the module before wiring work.**
Risk of electric shock, fire and malfunction.
- **Tighten the screw of terminal block with the specified torque range.**
If the terminal screw is loose, it can cause fire and electric shock.
- **Use the PLC in an environment that meets the general specifications contained in this datasheet.**
Risk of electrical shock, fire, erroneous operation and deterioration of the PLC.
- **Be sure that external load does not exceed the rating of output module.**
Risk of fire and erroneous operation.
- **Do not use the PLC in the environment of direct vibration**
Risk of electrical shock, fire and erroneous operation.
- **Do not disassemble, repair or modify the PLC.**
Risk of electrical shock, fire and erroneous operation
- **When disposing of PLC and battery, treat it as industrial waste.**
Risk of poisonous pollution or explosion.

■ Precautions for use

- Do not install other places except PLC controlled place.
- Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC



- Connect expansion connector correctly when expansion module is needed.
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off power when attaching or detaching module.
- Cellular phone or walkie-talkie should be farther than 30cm from the PLC.
- Input signal and communication line should be farther than 10cm from a high-tension and a power line in order not to be affected by noise and magnetic field.

Related Manual

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Name	Code
XG5000 User's Manual(Programming software)	10310000512
XGK/XGB Instruction & Programming User's manual	10310000510
XGB Cnet I/F User's Manual	10310000816
XGB Standard/Economic Hardware User's manual	10310001091

Revision History

Date	Version	Updated Information
2010.2	V1.0	First Edition
2010.3	V1.1	Error in performance specifications is fixed
2011.5	V3.0	KOREAN/ENGLISH data sheet integrated CI Changed

Applicable version

For system configuration, the following version is necessary.

Item	Applicable version
XG5000	V3.4 or above

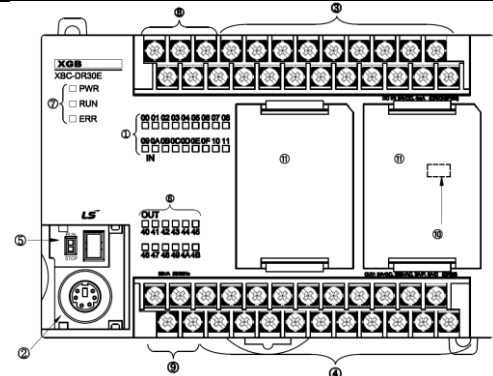
1. General Specifications

No	Item	Specification	Standard
1	Operating temperature	0 ~ 55℃	-
2	Storage temperature	-25 ~ 70℃	-
3	Operating humidity	5 ~ 95%RH, non-condensing	-
4	Storage humidity	5 ~ 95%RH, non-condensing	-
5	Vibration resistance	For discontinuous vibration Frequency Acceleration Amplitude 10s1/57 Hz 9.8m/s² (1G) 0.075 mm 57 s1/57 Hz 9.8m/s² (1G) - For continuous vibration Frequency Acceleration Amplitude 10s1/57 Hz 9.8m/s² (1G) 0.035 mm 57 s1/57 Hz 4.9m/s² (0.5G) - 10 times in each direction for X, Y, Z	IEC61131-2
6	Shocks resistance	Max. impact acceleration: 147 m/s² (15G) Authorized time: 11ms Pulse wave: Sign half-wave pulse (Each 3 times in X,Y,Z directions)	IEC61131-2
7	Noise resistance	Square wave impulse noise AC: ±1,500V DC: ±900V Electrostatic discharge Voltage: 4kV (Contact discharge) Radiated electromagnetic field noise 80 ~ 1,000 MHz, 10 V/m Fast transient /burst noise Segment Power supply module Digital/analog input/output communication interface Voltage 2 kV 1 kV	LSIS standard IEC61131-2 IEC 000-4-2 IEC61131-2 IEC61000-4-3 IEC61131-2 IEC61000-4-4
8	Ambient conditions	No corrosive gas or dust	-
9	Operating height	2000m or less	-
10	Pollution degree	2 or less	-
11	Cooling type	Natural air cooling	-

2. Performance Specifications

Item	Specification	Ref.
Operation method	Reiterative operation, fixed cycle operation Interrupt operation, constant period scan	
I/O control method	Scan synchronous batch processing (refresh method) Direct method by instruction	
Program language	Ladder Diagram Instruction List	
No. of instruction	Basic 28 Application 677	
Operation speed (Basic instruction)	0.24µs/Step	
Program memory	4ksteps	
I/O points	14 (main +1 option) 18 (main +1 option) 28 (main+2 options) 38 (main+2 options)	
Data area	P P0000 ~ P127F (2,048 points) M M0000 ~ M255F (4,096 points) K K00000 ~ K2559F (Special area : K2600~2559F) (40,960 points) L L00000 ~ L1279F (20,480 points) F F000 ~ F255F (4,096 points) T T00ms, 10ms, 1ms : T000 ~ T255 (256 points) (Variable by parameter setting) S S00.00 ~ S127.99 D D0000 ~ D5119 (5120 words) U U00.00 ~ U0A.31 (256 words, analog data refresh area) Z Z000~Z127 (128 words)	Word Word Word Word
No. of programs	Max. 128	
Tack	Fixed cycle Max. 8 External point Max. 4 Internal device Max. 8	
Operating mode	RUN, STOP	
Self-diagnosis	Delay of operation, abnormal memory, abnormal I/O	
Program port	RS-232C(Loader)	
Data keeping method at power failure	Setting latch area at basic parameter	
Cnet I/F function	Dedicated protocol Modbus protocol User defined protocol Selects one port between RS-232C 1 port and RS-485 1 port by parameter	
Performance	1-phase: 4kps 4 channels 2-phase: 2kps 2 channels	
Counter mode	4 counter modes are supported based on input pulse and INC/DEC method • 1 pulse operation Mode : INC/DEC count by program pulse input • 2 pulse operation Mode : INC/DEC count by input pulse • 2 pulse operation Mode : INC/DEC count by difference of phase	
Function	Internal/External preset function Latch counter function Comparison output function Revolution number per unit time function	
Pulse catch	50µs 4 points (P0000 ~ P0003)	
External point interrupt	4 points: 50µs (P0000 ~ P0003)	
Input filter	Selects among 1,3,5,10,20,70,100ms (For each module)	
Current consumption (mA)	250 315 355 485	
Weight(g)	330 340 450 465	

3. Parts Name and Descriptions



No	Name	Description
①	Input status LED	Indicates input status.
②	PADT Connector	Connector to connect with XG5000 RS-232C 1 channel
③	Input terminal block	Input Terminal Block
④	Output terminal block	Output terminal block
⑤	RUN/STOP mode switch	Sets the operation mode of main unit. • STOP → RUN : Operation execution of program • RUN → STOP : Operation stop of program (In case of STOP, it can be changed to remote mode)
⑥	Output status LED	Indicates output status
⑦	Operation status LED	Indicates the operation status of the main unit • PWR(RED ON) : Indicates power status. • RUN(GREEN ON) : RUN mode • ERR(RED blink) : indicates error
⑧	Built-in Communication Terminal block	Terminal block for built-in RS-232C/485 communication
⑨	Power terminal block	Terminal block for power (AC 100~240V)
⑩	O/S mode dip switch	Dip switch for selecting Operation or O/S download mode • On: BOOT mode. Downloading O/S is available • Off: User mode. Downloading program by PADT is available
⑪	Option board holder	For connecting option board

4. I/O No. Allocation Method

- (1) I/O No. Allocation grants address to unit & module for input/output data



Main unit Option module #1-2

Mounting module	No. of module can be mounted	Ref.
Option module	1	10/14 points unit
	2	20/30 points unit

- (2) The following is method of I/O number allocation

Item	Input	Output	Ref.
Main unit	P0000 ~ P003F P0040 ~ P007F	Fixed	
Option #1	P0400~P043F	64point fixed	
Option #2	P0440~P047F	64point fixed	

- I/O allocation for all expansion modules is fixed at 64points
(The unused area can be used as internal relay)

5. Built-in High Speed Counter Function

- (1) Summary

The high-speed counter can count high frequency pulse which can not be processed with the input unit. It can count pulse which occurs from encoder or pulse generator.

- (2) Performance Specification

Item	Specification
Signal	A Phase, B Phase
Input Signal	Signal level DC24V Signal Type Voltage Input (Open collector)
Counting range	Signed 32 Bit (-2,147,483,648 ~ 2,147,483,647)
Counting speed	1-phase: 4kpps 4 channels 2-phase: 2kpps 2 channels
Counter format	Linear counter / Ring counter
Counter mode	1 pulse operation Mode : INC/DEC count by program 1 pulse operation Mode : INC/DEC count by phase B pulse input 2 pulse operation Mode : INC/DEC count by input pulse 2 pulse operation Mode : INC/DEC count by difference of phase (4 multiplication)
Function	Internal/External preset function / Latch counter function Compare output function / no. of rotation per unit time

6. PID Control Function

- (1) Dedicated communication

XGB Compact Type has built-in Cnet communication function, and can communicate with various external devices without expansion Cnet I/F module.
(XGB Compact Type Main Unit has built-in RS-232C and RS-485.)

Built-in Cnet of XGB Main Unit supports the following functions;

- (a) Read single/continuous device
- (b) Write single/continuous device
- (c) Register monitoring device
- (d) Execute monitoring
- (e) 1:1 connection system (LS link)
- (2) User defined communication
User can define a user-defined protocol to communicate with other manufacturer's devices. By supporting user-defined protocol, XGB PLC can communicate with various devices which have their own protocol.
- (3) Modbus protocol
XGB PLC includes Modbus protocol, and it is easy to connect to Modbus devices. (It is not necessary to write Modbus protocol as user-defined protocol.)
- (4) P2P communication support
XGB PLC supports client function service with P2P form to above item.

Remarks

- 1) Please refer to XGB Cnet I/F User's Manual for the details of built-in Cnet I/F function.

7. Other Built-in Function

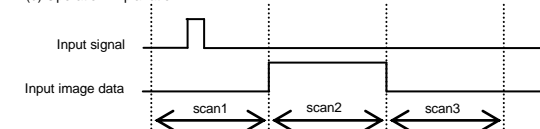
- (1) Pulse Catch Function

In the main unit, 4 pulse catch input contact points (P000~P003) are included. Through using this contact point short pulse signal (min. 50µs) which cannot be executed by general digital input can be taken.

- (a) Usage

When narrow pulse signal is input which can not be executed by general digital input, the operation can not performed as user's intention. But in this case through pulse catch function even narrow pulse signal (min. 10µs) can be executed.

- (b) Operation Explanation



Step	Execution contents
Scan1	CPU senses input when pulse signal of min. 50µs is input, then saves the status.
Scan2	Turns on the region of input image.
Scan3	Turns off the region of input image

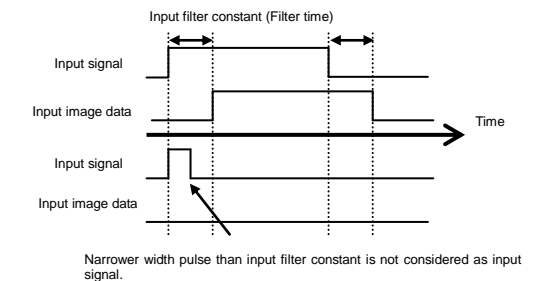
- (2) Input Filter Function

The input filter function can be used to reject noises. The input filter constant from the range of 1-100ms can be designated.

- (a) Usage

Input signal status affects the credibility of system where noise occurs frequently or pulse width of input signal affects as a crucial factor. In this case the user sets up the proper input on/off delay time, the trouble by miss operation of input signal may be prevented because the signal which is shorter than set up value is not adopted.

- (b) Operation Explanation



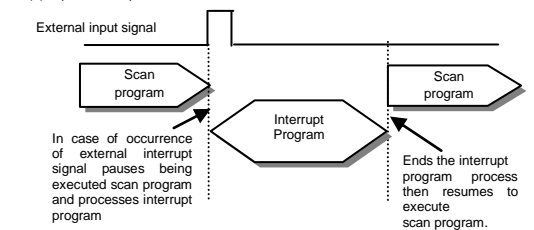
- (3) External interrupts function

XGB PLC can perform max 4 external contact tasks by using input of main unit without special interrupt module

- (a) Usage

This function is useful when you need to process operation related to external input signal fast without scan time.

- (b) Operation Explanation



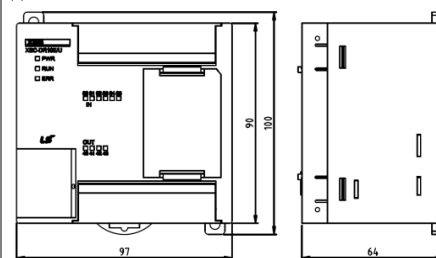
- (c) Function

- 1) It can be use the max. 4 point input (P000 ~ P003).
- 2) Input 4 points (P000 ~ P003) of XGB Compact Type Main Unit are shared for several functions as following table.
- 3) Each of the functions can be disabled according to whether other functions are enabled.

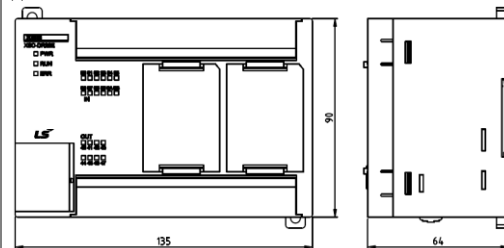
Input Point	High Speed Counter	External Interrupt	Pulse Catch	Input Filter
P000	Ch0 Input	Unavailable	Unavailable	Available
P001	Ch1 Input	Unavailable	Unavailable	Available
P002	Ch2 Input	Unavailable	Unavailable	Available
P003	Ch3 Input	Unavailable	Unavailable	Available

8. Dimension (mm)

- (1) XBC-DR10/14E



- (2) XBC-DR20/30E



9. Warranty

- (1) Warranty period

LSIS provides an 18-month-warranty from the date of the production.

- (2) Warranty conditions

For troubles within the warranty period, LSIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.

- (a) The troubles caused by improper condition, environment or treatment except the instructions of LSIS.
- (b) The troubles caused by external devices.
- (c) The troubles caused by remodeling or repairing based on the user's own discretion.
- (d) The troubles caused by improper usage of the product.
- (e) The troubles caused by the reason which exceeded the expectation from science and technology level when LSIS manufactured the product.
- (f) The troubles caused by natural disaster.
- (3) This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.